THE ART OF

Photographic Etching.

BY

WILLIAM STRUDWICK.

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THE process described in this little manual is one which, on its own merits, deserves to be widely known and applied. It is so simple in manipulation, and certain in its results, that it may be practised by any one having a knowledge of drawing, or ability sufficient for copying drawings already made; and I am persuaded that all who try it for themselves, taking pains and bringing a little patience to bear upon the subject, will not in the end be disappointed. Its nature is well expressed by the term "Photographic Etching." It is in fact a process of etching upon glass, (which avoids the comparatively tedious and inconvenient use of aqua fortis) and subsequently of printing by Photographic agency. It dispenses with the usual Photographic Camera, and all expensive apparatus in its operations; by its means the *creations of the mind* can be perpetuated, as well as delineations of all natural objects, plans, diagrams, &c.; and, in short, it appears to be capable of being turned to good account by many of the Artistic professions.

It is a fact well known to Photographers that a collodionized plate being saturated in the silver bath, becomes highly sensitive to white light, and, on being exposed to it for a while, and afterwards treated with a *developer*, becomes more or less opaque. It is also well known to Photographers,

that paper prepared first in a solution of salt, and then in a solution of nitrate of silver, is also made sensitive to white light, so that on being exposed to it, it will gradually turn black.

On these two facts the process in question depends, and I will now as simply as possible proceed to explain it. It is necessary, first, to render a glass plate *opaque*. This may be done in the following manner:—make a solution of nitrate of silver of the strength of 30 grains to an ounce of distilled water. The *quantity* of solution to be made must be determined by the size of the plate and the vessel in which the solution is to be contained. The best plan would be to procure an ordinary photographic bath for plates up to about 12-in. by 9-in., and a flat porcelain dish for larger sizes. Being prepared with the bath, which, though not absolutely necessary, should be used in a dark room * or one artificially lighted,—take a glass plate in the left hand, and pour on a liberal quantity of *negative collodion*, tilting the plate gently, that it may flow up to each corner in succession; the surplus must be poured back into the bottle from the last corner covered with the collodion, which should be the one nearest the right hand. The collodion will almost immediately *set*, and when so, place the plate on the *dipper*, (an appur-

* A dark room may be made of any room by covering the window with a triple thickness of glazed yellow calico; this will give plenty of light for working, and will prevent the sensitive plates from being affected until fully exposed.

tenance of the bath) and plunge it steadily, but without stopping, into the silver solution; let it remain at least two minutes. Should the plate when withdrawn from the bath appear as though it had been oiled, return it, and allow it to remain until the solution is found, on viewing it again, to flow evenly over the surface. A change will have come over the plate by the precipitation of an iodide of silver;—it is now to be fully exposed to daylight for two or three minutes, and have one of the following developers poured over it in sufficient quantity to well cover it.

No. 1.	Pyrogallic Acid	3 grains.
	Glacial Acetic Acid	1 drachm.
	Spirits of Wine	10 drops.
	Distilled Water	2 ounces.
No. 2.	(Solution 1.)	
	Proto-sulphate of Iron.....	1 ounce.
	Glacial Acetic Acid	½ ounce.
	Distilled Water	10 ounces.
	(Solution 2.)	
	Nitrate of Potash.....	6 drachms
	* Distilled Water.....	10 ounces.

This operation must be performed with some nicety. Hold the plate a little sloping away from you, and pour on the developer at the corner next the thumb, at the same time running the lip of the measure glass containing the liquid along the edge

* All these proportions may be increased or diminished according to the quantity required. The two solutions of No. 2 developer are to be made in separate bottles and mixed in equal quantities at the time of using.

of the plate. As soon as the plate is covered bring it to a horizontal position, and allow the developer to remain on it until sufficient opacity is obtained. It is then to be carefully washed under a tap and left to dry. The drying may be accelerated by holding it to the fire, or using a spirit-lamp. When perfectly dry, varnish with spirit varnish by pouring it over the plate in the same manner as the collodion. This will leave in a very short time a beautifully even and polished surface, and the plate is ready for use.

But what *is* the use of it? The fact that paper may be made highly sensitive to light, has been before referred to; it will be obvious, therefore, that if there be anything to cover any portion of the sensitive paper and obstruct the light, the part so covered will remain *white*, while the uncovered portion will be darkened; thus, if the opaque plate be laid upon the sensitive paper, you will have a white patch left exactly the size of the plate. If, however, a scratch be made on the glass and the opaque deposit removed thereby, there will be a *corresponding black line* on the paper underneath, because, where the scratch is, the light will be able to pass through and affect the sensitive surface.

Now, if the mark on the opaque glass, instead of being an indefinite scratch, be made to represent a *form* of any kind, say a word or figure or any natural object, it is clear that a fac-simile will be conveyed on to the sensitive paper, and

hence it will be further readily perceived that it is only necessary to draw upon the opaque plate a landscape, picture, plan or what you will, and you have an etching or engraving from which may be taken an unlimited number of copies. An Artist may etch upon the plate a finished and delicate drawing, and without the trouble of "biting in" with aquafortis, as on copper, his etching is ready for printing; he has only to lay the etched side of the plate on the sensitive surface of the paper, and the sun himself will be his printer. Additions and alterations can easily be made and proofs taken until the desired effects be obtained.

The salted paper before-mentioned is of two kinds: plain and albumenized. The plain has a dead surface, the albumenized is glossy; the latter, perhaps, is best for the purpose in hand. To make it sensitive, pour into a clean dry porcelain dish enough nitrate of silver solution of the strength of 60 grains to an ounce of distilled water, to perfectly cover the bottom of the dish, and lay upon it the prepared side of the paper by bending it up in the shape of the letter U, and letting the ends gradually fall. All air bubbles must be excluded, and this will be found the best way for preventing and getting rid of them. The sensitizing of the paper must be effected by artificial, or very subdued daylight, or in the dark room. In five minutes remove the sheet of paper, pin it by one corner, and hang it up to dry. It must be kept from daylight until exposed under the glass plate.

In making the drawing upon the plate, whatever it may be, remember it must be *reversed* in order to print *correctly*. If the operator have not sufficient confidence in his own powers to allow him to make his drawing at once upon the plate, the design previously drawn may be placed before a looking glass to show it in the reversed position. A design may also be *transferred* to the plate by rubbing some red chalk on one side of a sheet of thin paper, and laying it upon the plate, with the design over all, trace the lines with a hard and moderately sharp point; this will leave a red outline, to be afterwards worked out with etching needles or other suitable instrument. Let each line be carefully and cleanly cut: thick lines may be produced with a stout needle, fine lines with a sharper one; much may be done with the round blade of a pen-knife, the blade being held almost perpendicularly, the point will give a fine line, while the edge of the blade when brought to a more horizontal position will give a variety of bold thick lines. The effect of the drawing in all cases will depend much upon the artistic skill of the manipulator.

If the plate be injured, or errors made in the drawing, they may be stopped out by painting over them with *yellow*, the defective parts being easily made good by re-etching. The reason for using yellow is explained by the fact, that that colour has the power of stopping the actinic rays of light. A thin *glaze* of yellow may also be employed to give the sky and other parts of a picture a lighter

and less powerful tone in printing; it must be only a glaze just enough to *partially* prevent the action of the light.

In printing, the paper and plate must be pressed close together, or the picture will be blurred; they may be laid on a perfectly flat surface and kept together by a weight at each end, but the best and most certain plan would be to use a proper printing frame, which will allow the picture to be *viewed* while printing; they are sold at the photographic houses. When sufficiently printed, remove the picture and soak it in the following solution, for at least half an hour to fix and tone it.

Hyposulphite of Soda	3 ounces
Chloride of Gold	8 grains.
Distilled water	1 pint.

The print will be reddened by the soda and afterwards darkened by the gold. The toning is only a question of time, and should not be overdone. Finally, the print must be well washed (several may be done at one time) by stirring it in a large pan of water, and leaving it some hours to soak; the water should be changed at intervals. It may also be placed under a water tap half turned on, which will itself give a constant change of water and serve as an agitator. The paper being firm and tenacious, the print will bear considerable handling, but should be taken hold of always by one corner. It may be finished off by laying it on a slab and brushing it lightly on both sides with a broad camel hair brush while the water

is running on it. When it is considered to be sufficiently washed, lay it on a sheet of blotting paper to absorb the excess of moisture, and allow it to dry. The picture is then finished and may be mounted.

There is another method (and a very good one) for preparing the opaque plate, which dispenses with the silver bath altogether. In this case procure the following articles:—a ball of * etching ground tied up in a piece of fine silk, a flat dabber made of wool and tied up in silk, with a piece of stout card, nearly as large as the dabber itself, placed under the knot that forms the handle to make it firm; and a wax candle. It will also be well to have a small handvice, the lips covered with wash-leather for holding the plate when hot.

Having these means at hand, proceed to heat the glass on a stove, or otherwise, until, on applying the etching ground, it will freely melt and come through the pores of the silk; if sufficiently heated, cover the plate with the ground by moving it slowly from end to end in one direction and then crosswise until no part has been left untouched. Next render the surface quite even by dabbing it all over with the dabber; and before the plate gets cold (it may be warmed again should it have become so) with the lighted candle, smoke it by holding it over the flame. In doing this, be careful not to let the wick touch it, and to keep the candle *moving*, or it will burn the ground; this

* Etching Ground, &c., can be bought where engravers tools are sold. It may be obtained at Fenn's, in Newgate Street.

latter defect, though not nearly so serious as in etching on copper, may as well be avoided. If this operation be nicely done there will be a black shining layer impervious to light spread over the glass. The etching ground being of a deep yellow colour would alone obstruct the light, but the black surface is much more pleasant to work upon, and will the better enable you to see the progress of your work.

The plate may be laid over white paper and the drawing commenced; the ground will be found to remove most kindly, as the etching point travels over the surface, but the facility of working must not lead to careless drawing, or tempt you to work too fast. By holding the plate up to the light, it may be clearly seen what progress is made. If errors appear they may be blotted out with yellow, and re-etched as before, and the lines required to print light, lowered with the glaze. In general, the subduing the force of certain lines will not be necessary, but it may be an advantage in fine work. In all other respects when the drawing is completed, the operator must proceed according to the instructions already given.

I have thus briefly described an art which I think the coolest judgments will allow is likely to be of much value. By it Architects and Surveyors, and Scientific men can copy their plans *ad infinitum*, by simply making an original drawing on the plate.

Artists will be enabled to perpetuate their designs in the broadest or most delicate manner, and will themselves have the means of producing, at any time, a copy of their own works.

To Amateurs and private persons, the process will serve as an elegant recreation; they may draw or copy a favourite subject, and be able to furnish their friends with copies, exact counterparts of the original.

In conclusion, I may be permitted to state, for the information of those persons to whom it may be inconvenient to make their own drawings, that I shall be prepared to execute drawings for them at a moderate cost, and further, that to any one who, in working the process, may meet with a difficulty in matters of detail or otherwise, I shall be willing, on receiving a stamped addressed envelope, to send an answer to any question he may be desirous of asking.

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